

**STRUCTURE FOR AND METHOD OF FABRICATING
A HIGH-MOBILITY FIELD-EFFECT TRANSISTOR**

ABSTRACT OF THE DISCLOSURE

A structure and method of fabricating a high-mobility semiconductor layer structure and field-effect transistor (MODFET) that includes a high-mobility conducting channel, while at the same time, maintaining counter doping to control deleterious short-channel effects. The MODFET design includes a high-mobility conducting channel layer wherein the method allows the counter doping to be formed using a standard technique such as ion implantation, and further allows the high-mobility channel to be in close proximity to the counter doping without degradation of the mobility.